

PATENT ABSTRACTS OF JAPAN

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**(54) REFILLING OF INK JET CARTRIDGE WITH INK**

**(57)Abstract:**

PURPOSE: To minimize a substance to be discarded in an ink refilling method by measuring the residual amt. of ink and the components of residual ink and performing refilling corresponding to the data in the measuring process.

CONSTITUTION: The measurement of an ink residual amt. and that of the components of residual ink are performed and, corresponding to the data of these two processes, the refilling of ink is performed. By this constitution, when an ink is refilled, the waste soln. discharged at the time of washing is not discharged in order to refill an ink jet cartridge with ink without containing a washing process and residual ink can be reutilized by inspection. Concretely, the ink tank is recovered and a small amt. of ink for inspection is extracted from the ink tank after the appearance inspection of the ink tank is completed to measure the residual amt. of ink. Next, absorbancy is measured and the refilling with ink is performed on the basis of the measured result to regenerate the ink tank.

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## CLAIMS

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[Claim(s)]

[Claim 1] The refill approach of the ink characterized by including the process which performs a refill according to the information on the process and (3) front 2 processes of performing component measurement of the process (2) \*\* ink which measures (1) ink residue in the approach of performing the refill of ink to an ink jet recording device.

[Claim 2] The refill approach of ink according to claim 1 that component measurement of \*\* ink is performed by the absorptiometry.

[Claim 3] The refill approach of ink according to claim 1 that component measurement of \*\* ink is performed by the chromatography.

[Claim 4] The refill approach of ink according to claim 1 that component measurement of \*\* ink is color-material density measurement.

[Claim 5] The refill approach of ink according to claim 1 that component measurement of \*\* ink is solvent density measurement.

[Claim 6] The refill approach of ink according to claim 1 that refill ink is \*\* ink and an affiliated color.

[Claim 7] The refill approach of ink according to claim 1 with as unique refill ink as \*\* ink.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the refill approach of the ink of an ink jet cartridge.

[0002]

[Description of the Prior Art] Global environment problems are becoming more serious recent years still. In order to be under such a situation, and for human beings to continue and to develop, a deployment of a resource is indispensable and it cannot be overemphasized that the ultimate approach of a deployment is playback (recycle). all the things that human beings used although the population problem itself also needed to be solved of course in order to cope with the population explosion in the near future -- recycling -- a required resource -- by all means -- base -- recycling should be carried out quickly and the effective amount of resources per unit time amount should be increased.

[0003] Recycle of a used product is performed briskly [ paper, a bottle, a can, etc. ] for many years, and the effectiveness has fully been proved. Probably, in the near future, recycle must be

performed such in not only a thing but in all products.

[0004] If the head section which divides roughly into the form of the ink tank of an ink jet, and performs the regurgitation, and an ink tank are united and ink is exhausted. Although a user exchanges an ink tank for the type thrown away using the whole cartridge the whole head section when the head section and the ink tank section can dissociate easily and exhaust ink, and the head section has two sorts of the type which can be used repeatedly. Whichever it makes it a type, the ink tank is thrown away, and a container and \*\* ink were useless.

[0005] Moreover, a thing called a refill was not reusing the contents which remain only in the way of thinking a container's being reused conventionally.

[0006] In order to reuse only a container in the above-mentioned conventional example, the contents (ink) which remain including the washing process of a container were thrown away, and were useless. Moreover, if a washing process is included, the waste fluid causes water pollution.

[0007]

[Problem(s) to be Solved by the Invention] The purpose of this invention is offering the refill approach of the ink which minimizes the matter to discard.

[0008]

[Means for Solving the Problem] This invention is the refill approach of the ink characterized by including the process which performs a refill according to the information on the process and (3) front 2 processes of performing component measurement of the process (2) \*\* ink which measures (1) ink residue in the approach of performing the refill of ink to an ink jet recording device.

[0009] According to this invention, futility is lost, in order not to discharge the waste fluid which comes out at the time of washing in order to carry out the refill of the ink on the occasion of the refill to an ink tank excluding a washing process and to also reuse \*\* ink by inspection.

[0010] Drawing 1 shows one gestalt of this invention. What ink tanks were collected and visual inspection finished measures a little sampling residue for checking ink first, then measures an absorbance, and refill-reproduces an ink tank for ink based on those results.

[0011] Drawing 2 is what showed other gestalten of this invention, and component measurement of \*\* ink is changed to the spectrometry in the case of drawing 1, and uses a chromatography.

[0012]

[Example] An example explains this invention to a detail further.

Example 1 color concentration collected the ink tanks of the yellow containing 20g of nominal ratings at 3%. First, it was 5g, when visual inspection was carried out and little sampling and a residue were measured for checking ink. Next, when the absorbance of the extracted checking ink was measured and it compared with the calibration curve of measurement separately, it turned out that color concentration is 3.8%. Then, the amount of yellow ink and the amount of water which are applied in order to obtain ink of 3.0% of color concentration 20g were calculated by count, the refill of yellow ink 13.7g and the 1.3g of the water was carried out, and the ink tank containing 20g was reproduced. In addition, in the inspection before carrying out a refill, measurement of turbidity, pH, and inorganic element concentration may be performed, and the refill of the ink which considered the result may be carried out, and the refill of the deep ink of a color tone may be carried out.

The ink tanks of the black containing 20g whose ethanol concentration which is a volatile component in example 2 ink is 4% were collected, and the ethanol concentration of even if it carries out the refill of the black ink with which the ethanol which volatilized to this is compensated tried to reproduce the ink tank containing 20g at 4%.

[0013] First, it was 5g, when visual inspection was carried out and the little sampling residue was measured for checking ink. Next, when the gas chromatography of the extracted checking ink was measured and the calibration curve of measurement was compared separately, it turned out that ethanol concentration is 1%. Then, 15g refill of the black ink whose ethanol concentration is 5% was carried out, and ethanol concentration reproduced the ink tank of BURAKKUN containing 20g at 4%.

[0014] Although the gas chromatography shown in drawing 2 performed measurement of ethanol concentration in this example, other well-known techniques in which solvent concentration, such as liquid chromatography, can be judged may be used.

an example 3 -- it is the example which carries out the refill of the ink of another color, and reproduces the ink tank of another color further in this example.

[0015] It tried for color concentration to collect the ink tanks of the yellow containing 20g at 3%, and to make the ink tank of Green entering 20g. The ink residue after checking ink extraction was 5g. When the absorbance was measured like the example 1, the color concentration of the yellow of \*\* ink was 3%, and when color concentration of color concentration:cyanogen of yellow was further set to 2:3, it turned out that it becomes Green. Then, 12g refill of the cyanogen ink 3g and whose color concentration are 3% about the yellow ink whose color concentration is 3% was carried out, and the ink tank of Green containing 20g was reproduced.

[0016]

[Effect of the Invention] According to this invention, it becomes reproducible [ the ink tank which can also perform reuse of \*\* ink ] excluding a washing process as mentioned above.

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## TECHNICAL FIELD

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[Industrial Application] This invention relates to the refill approach of the ink of an ink jet cartridge.

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## PRIOR ART

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[Description of the Prior Art] Global environment problems are becoming more serious recent years still. In order to be under such a situation, and for human beings to continue and to develop, a deployment of a resource is indispensable and it cannot be overemphasized that the ultimate approach of a deployment is playback (recycle). all the things that human beings used although the population problem itself also needed to be solved of course in order to cope with the population explosion in the near future -- recycling -- a required resource -- by all means -- base -- recycling should be carried out quickly and the effective amount of resources per unit time amount should be increased.

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## EFFECT OF THE INVENTION

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[Effect of the Invention] According to this invention, it becomes reproducible [ the ink tank which can also perform reuse of \*\* ink ] excluding a washing process as mentioned above.

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] The purpose of this invention is offering the refill approach of the ink which minimizes the matter to discard.

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## MEANS

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[Means for Solving the Problem] This invention is the refill approach of the ink characterized by including the process which performs a refill according to the information on the process and (3) front 2 processes of performing component measurement of the process (2) \*\* ink which measures (1) ink residue in the approach of performing the refill of ink to an ink jet recording device.

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## EXAMPLE

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is drawing showing an example of the process of the approach of this invention.

[Drawing 2] It is drawing showing other examples of the process of the approach of this invention.

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最終頁に続く

(54)【発明の名称】 インクジェットカートリッジにインクをリフィルする方法

(57)【要約】

【構成】 インクジェット記録装置にインクのリフィル  
を行う方法において(1)インク残量の測定を行う工  
程、(2)残インクの成分測定を行う工程、及び(3)  
前二工程の情報に応じてリフィルを行う工程を含むこと  
を特徴とする。

【効果】 洗浄工程を含まず、残インクの再利用もでき  
るインクタンクの再生が可能となる。

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## 【特許請求の範囲】

【請求項1】 インクジェット記録装置に、インクのリ

フィルを行う方法において、

(1) インク残量の測定を行う工程

(2) 残インクの成分測定を行う工程および

(3) 前二工程の情報に応じてリフィルを行う工程を含むことを特徴とするインクのリフィル方法。

【請求項2】 残インクの成分測定が吸光光度法により行われる請求項1に記載のインクのリフィル方法。

【請求項3】 残インクの成分測定がクロマトグラフィーにより行われる請求項1に記載のインクのリフィル方法。

【請求項4】 残インクの成分測定が色材濃度測定である請求項1に記載のインクのリフィル方法。

【請求項5】 残インクの成分測定が溶剤濃度測定である請求項1に記載のインクのリフィル方法。

【請求項6】 リフィルインクが残インクと同系色である請求項1に記載のインクのリフィル方法。

【請求項7】 リフィルインクが残インクと異色である請求項1に記載のインクのリフィル方法。

## 【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明はインクジェットカートリッジのインクのリフィル方法に関する。

【0002】

【従来の技術】 地球環境問題は近年ますます深刻になりつつある。このような状況の下にあって、人類が持続して発展してゆくためには、資源の有効利用が必須であり、有効利用の究極の方法が再生（リサイクル）であるのは言うまでもない。近未来における人口爆発に対処するためには、人口問題そのものの解決もむろん必要であるが人類が使用したものすべてをリサイクルし、必要な資源はすべからく素速く再循環させ、単位時間当たりの有効な資源量を増大させるべきである。

【0003】 使用済製品のリサイクルは古くから、紙、ビン、カン等で盛んに行われてきており、その有効性は十分に証明されてきている。近い未来においてはこのようなものだけでなく、すべての製品においてリサイクルが行われねばならないであろう。

【0004】 インクジェットのインクタンクの型式には大別して吐出を行うヘッド部とインクタンクが一体となっていてインクを使い切ると、ヘッド部ごとカートリッジ全体を使い捨てるタイプと、ヘッド部とインクタンク部が容易に分離できインクを使い切ったときにユーザーがインクタンクを交換し、ヘッド部は繰り返し使用できるタイプの2種があるが、どちらのタイプにしてもインクタンクは使い捨てになっており、容器及び残インクが無駄になっていた。

【0005】 また、従来、リフィルというものは、容器を再利用しようという発想のみで残っている中味を再利

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用しようというものではなかった。

【0006】 上記従来例では、容器のみを再利用しようとするため、容器の洗浄工程を含み、残っている中味（インク）は捨てられていて無駄であった。また洗浄工程を含むとその廃液は水質汚濁の原因にもなっている。

【0007】

【発明が解決しようとする課題】 この発明の目的は、廃棄する物質を最小限にとどめるインクのリフィル方法を提供することである。

【0008】

【課題を解決するための手段】 この発明は、インクジェット記録装置に、インクのリフィルを行う方法において、

(1) インク残量の測定を行う工程

(2) 残インクの成分測定を行う工程および

(3) 前二工程の情報に応じてリフィルを行う工程を含むことを特徴とするインクのリフィル方法である。

【0009】 本発明によれば、インクタンクへのリフィルに際し、洗浄工程を含まず、インクをリフィルするため、洗浄時にでる廃液を排出することはなく、また、残インクも検査により再利用するため無駄がなくなる。

【0010】 図1は本発明の一形態を示したものである。インクタンクが回収され外観検査の終ったものはまず検査用のインクを少量抜き取り残量を測定し、次に吸光度を測定し、それらの結果をもとにインクをリフィルし、インクタンクを再生させるものである。

【0011】 図2は本発明の他の形態を示したもので残インクの成分測定は、図1の場合の吸光度測定にかえてクロマトグラフィーを用いたものである。

【0012】

【実施例】 本発明を実施例によりさらに詳細に説明する。

## 実施例1

染料濃度が3%で公称20g入りのイエローのインクタンクを回収した。まず、外観検査をし検査用のインクを少量抜き取り、残量を測定したところ5gであった。次に採取した検査用インクの吸光度を測定し、別途測定の検量線と比較したところ、染料濃度が3.8%であることがわかった。そこで染料濃度3.0%のインク20gを得るために加えるイエローインクの量と水の量を計算で求め、イエローインク13.7g、水1.3gをリフィルして20g入りインクタンクを再生した。なお、リフィルする前の検査において、濁度、pH、無機元素濃度の測定を行い、その結果を加味したインクをリフィルしてもよく、また色調の濃いインクをリフィルしてもよい。

## 実施例2

インク中の揮発成分であるエタノール濃度が4%の20g入りブラックのインクタンクが回収され、これに揮発したエタノールを補うようなブラックインクをリフィル

してもとのエタノール濃度が4%で20g入りのインクタンクを再生することを試みた。

【0013】まず、外観検査をし検査用のインクを少量抜き取り残量を測定したところ5gであった。次に採取した検査用インクのガスクロマトグラフィーを測定し、別途測定の検量線を比較したところエタノール濃度が1%であることがわかった。そこでエタノール濃度が5%のブラックインクを15gリフィルし、エタノール濃度が4%で20g入りのブラックのインクタンクを再生した。

【0014】本例ではエタノール濃度の測定を図2に示すガスクロマトグラフィーで行ったが、液体クロマトグラフィー等の溶剤濃度が判定できる他の公知の技術を用いてもよい。

#### 実施例3

この実施例では、別色のインクをリフィルして、さらに別色のインクタンクを再生する例である。 \*

\* 【0015】染料濃度が3%で20g入りのイエローのインクタンクを回収しグリーンの20g入りのインクタンクを作ることを試みた。検査用インク採取後のインク残量は5gであった。実施例1と同じように吸光度を測定したところ残インクのイエローの染料濃度は3%で、さらにイエローの染料濃度:シアンの染料濃度を2:3にするとグリーンになることがわかった。そこで染料濃度が3%のイエローインクを3gと染料濃度が3%のシアンインクを12gリフィルし、20g入りのグリーンのインクタンクを再生した。

#### 【0016】

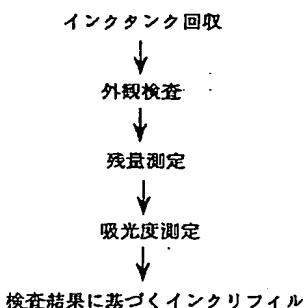
【発明の効果】以上のように本発明によれば、洗浄工程を含まず、残インクの再利用もできるインクタンクの再生が可能となる。

#### 【図面の簡単な説明】

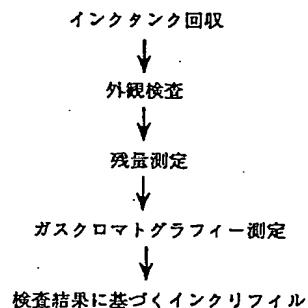
【図1】本発明の方法の工程の一例を示す図である。

【図2】本発明の方法の工程の他の例を示す図である。

【図1】



【図2】



#### フロントページの続き

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